

POPULATION ESTIMATES & PROJECTIONS

Research Brief No. 11
MARCH 2001

Understanding Census 2000: Coverage Issues and Growth Trends

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This research brief indicates where caution should be used in interpreting 1990s growth trends from Census 2000 data. Program management in social services, health, education, environmental, and other programs rely on accurate population growth data for planning purposes. In addition, population practitioners need to accurately determine population changes so they can evaluate and improve their estimation and forecast procedures after each decennial census.

The 2000 Census appears to be more accurate than previous censuses. Partnership and outreach programs, and a highly successful advertising campaign, reduced the national undercount rate by one-half percent or more. Census “coverage” for an area refers to how well a population was enumerated¹. When the coverage in one decennial census is markedly better, or worse, than the prior decennial census, true growth trends are distorted. Table 1 shows that the national undercount rate for the household population improved up to 0.6 percent in Census 2000. This means approximately 1.8 million people missed in the 1990 census count were picked up in the 2000 Census. Coverage improvements are substantially larger in Census 2000 for specific racial groups and Hispanics. The largest count improvement occurred for reservation Indians, with the percent undercounted dropping from 12.2 in 1990 to an estimated range of 2.8 to 6.7 in Census 2000.

Table 1: United States: Comparison of Estimated Net Undercount in the 1990 and 2000 Census²

Estimation Grouping	2000 Census Preliminary ACE Estimates of Net Undercount (Percent)		1990 Census PSE Estimate of Net Undercount (Percent)	Coverage Improvement Difference	
	Col.1	Col.2	Col.3	Col.4.=Col.3 -Col.1	Col.5.=Col.3. -Col.2
	Low	High		High	Low
Total Household Population.	.96	1.40	1.61	0.21	0.65
White or some other race (Not Hispanic).....	0.44	0.90	0.68	-0.22	0.24
Black/African American (Not Hispanic).....	1.60	2.73	4.57	1.84	2.97
American Indian & Alaskan Native (on reservations).....	2.77	6.71	12.22	5.51	9.45
Asian (Not Hispanic).....	-0.09	2.01	2.36	0.35	2.45
Hispanic Origin (of any Race).....	2.22	3.48	4.99	1.51	2.77

Source: 1990 data from “Report to the Committee on the Adjustment of Postcensal Estimates,” United States Department of Commerce, Bureau of the Census, August 7, 1992; Census 2000 data from “Preliminary Estimates Show Improvement in Census 2000 Coverage,” United States Department of Commerce News, Washington, D. C. February 14, 2001. Preliminary data for 2000, subject to change.

¹ Accuracy is determined by independent post-enumeration surveys.

² Racial and Ethnic Categories in 1990 and 2000 are not strictly comparable due to the changes in the categories in Census 2000.

Table 2 shows one method of adjusting for the difference in undercount in Washington for 1990 and 2000. The original population counts in 1990 and in 2000 are “adjusted upward” by adding the estimate of persons missed to the original census count. Then, the “adjusted” 1990 population is subtracted from the “adjusted” 2000 population to determine the amount of population change. However, coverage measurement is subject to sampling and other error and is not precise.³ The “High” and “Low” estimates of undercount in 1990 and in 2000 increase the possible adjustments to the census data at each census period.

Table 2: Adjusting Washington's 1990 and 2000 populations for Coverage Differences

Washington State	Original Census Count	Net Undercount Estimate ⁴ Low	Net undercount Estimate ⁴ High	Adjusted Population Low Undercount	Adjusted Population High Undercount
	Col.1	Col.2	Col.3	Col.4 =Col.1 + (Col.1 * Col.2)	Col.5 =Col.1 + (Col.1 * Col.3)
2000 Population	5,894,121	(US ratio) .0096	(US ratio) .0140	5,950,705	5,976,639
1990 Population	4,866,692	.01841	.02405	4,956,239	4,983,736
Change	1,027,429	-.00881	-.01005	994,466	992,903
Percent Change	21.1			20.1	19.9

Source: 1990 data from “Report to the Committee on the Adjustment of Postcensal Estimates,” United States Department of Commerce, Bureau of the Census, August 7, 1992; Census 2000 data from “Preliminary Estimates Show Improvement in Census 2000 Coverage,” United States Department of Commerce News, Washington, D. C. February 14, 2001. Preliminary data for 2000 is subject to change.

Table 3 shows the range of possible comparisons with the 1990 and 2000 adjusted census counts, and the population change outcomes. These combinations produce population change for the 1990s ranging from a high of 1,020,400 (20.5 percent) to a low of 966,969 (19.4 percent). If a single population change value is needed, an average or mid range figure would probably be best. The average shows a change of about 993,700 with a 1990 population of 4,970,000—equaling a growth of 20.0 percent. This approximation would assume that 33,700 persons were counted in 2000 that had been missed in 1990.

Table 3: 1990-00 Change for Washington from 1990 and 2000 “Adjusted Counts”

	2000 Low vs. 1999 Low	2000 High vs 1990 High	2000 Low Vs 1990 High	2000 High vs. 1990 Low	2000 Avg. vs. 1990 Avg.
2000 Adjusted Population	5,950,705	5,976,639	5,950,705	5,976,639	5,963,672
1990 Adjusted Population	4,956,239	4,983,736	4,983,736	4,956,239	4,969,987
Change	994,466	992,903	966,969	1,020,400	993,684
Percent Change	20.1	19.9	19.4	20.5	20.0
Difference from Original Census 1990-00 Change (1,027,425)	32,959	34,522	60,456	7,025	33,741

Source: 1990 data from “Report to the Committee on the Adjustment of Postcensal Estimates,” United States Department of Commerce, Bureau of the Census, August 7, 1992; Census data from “Preliminary Estimates Show Improvement in Census 2000 Coverage,” United States Department of Commerce News, Washington, D. C. February 14, 2001. Preliminary data for 2000 is subject to change.

Table 4 shows a quick means of approximating the population added to the 2000 census count due to better coverage—without having to adjust the “original census counts” for 1990 and 2000. This procedure uses the net difference in the coverage rate between 1990 and 2000 (Column 3.) The difference in the coverage rate, .881 for the low net undercount estimate, is simply applied to the 1990 population. While this is not,

³ See “Accuracy and Coverage Evaluation” United States Department of Commerce, Bureau of the Census, June 2000, pages 9-15.

⁴ Percent undercount figures have been converted to ratios in this table by dividing by 100. This makes showing the steps in the calculations easier.

strictly speaking, a numerically appropriate procedure, it does provide a rough estimate of persons missed in 1990 that would be expected to be included in 2000.

Table 4: Quick Method of Determining Persons Included in 2000 that were missed in the 1990 Count

Washington State	1990	2000	Difference 1990-00	1990 Unadjusted Population	Estimate of Persons Missed in 1990 Included in 2000 Census
	Col.1	Col.2	Col.3 = Col.1-Col.2	Col.4	Col.6.=(Col.3/100) * Col.4
Net Undercount Low (%)	1.841	0.96	0.881	4,866,692	42,876
Net Undercount High (%)	2.405	1.40	1.005	4,866,692	48,910

Source: See Table 2.

Discussion:

The main purpose of this report to has been to impart an understanding of how enumeration differences may overstate or understate the population change. It should also be kept in mind that coverage rates are not exact. One only obtains an approximation of the differences in the decennial census counts due to coverage factors and how these impact growth trends.

The examples used in this paper have been developed using the net undercount rates for Washington in 1990 and using the United States rates for Washington for Census 2000. Thus, these examples are subject to change when the actual census 2000 coverage rates for Washington become available.

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